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wherein the improvement comprises the following steps:

- (a) providing organic coatings, films, layers and residues that are either photosensitive or non-photosensitive organic materials and are selected from the group con-10 sisting of polymerized photoresists, paints, resins, single and multilayer organic polymers, organo-metallic complexes, positive optical photoresist, negative optical photoresist, electronbeam photoresists, X-ray photoresists, ion-beam photoresists, ion-implanted photoresists, and other hardened photoresists, wherein said organic polymers are selected from the group consisting of polyimides, copolyimides, polyamides, polyamide-imides, fluorinated polyimides, 15 poly(arylenethers), fluorinated poly(arylenethers), perfluorinated alkylene oxides, parylene (N, C, D, or F type), poly(phenylquin-oxalines), poly-naphthalene, poly-fluorinated napththalene, benzocyclobutene (BCB), amorphous fluoropolymers, such as polytetrafluoroethylene, perfluorocyclobutane aromatic ether (PFCB), polynorbomene, and fluorinated carbon, and wherein said substrate consists of at least one portion of a device selected from the 20 group consisting of semiconductor devices and wafers, [ceramic devices,] liquid crystal display devices, flat-panel displays, printed circuit boards, magnetic read/write heads, thin-film read/write heads;
- (b) subjecting said organic coatings, films, layers, or residues of step (a) to a precursor chemical or physical treatment prior to step (1) so as to prepare said organic coatings, films, layers, or residues for exposure to gaseous sulfur trioxide for facilitating the reaction of said sulfur trioxide with the organic coatings, films, layers or residues to be removed;
 - (c) carrying out said step (1) so that said water-free, gaseous sulfur trioxide reacts with said organic coatings, films, layers, and residues to form physically or chemically altered organic material;
 - (d) carrying out said step (2) to remove said altered organic material from said substrates; and
 - (e) subjecting said organic coatings, films, layers, or residues to a chemical or physical post-rinse treatment subsequent to step (2) to remove any residual organic material from said substrates remaining after said solvent rinse.